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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/260,478	03/01/1999	IONEL JITARU		6598

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EXAMINER
LAXTON, GARY L

ART UNIT	PAPER NUMBER
2838	

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Applicati n No. 09/260,478	Applicant(s) TITARU, IONEL	
	Examiner Gary L. Laxton	Art Unit 2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 August 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al in combination with Morris.

Okamoto et al disclose an AC source of power, the rectifier as claimed and an inductor connected between the AC source and an input terminal to the rectifier.
However, Okamoto et al do not disclose the AC power source as having a dead time.
Morris teaches a magnetically integrated full wave DC to DC converter; especially in FIG. 13 wherein there is illustrated an embodiment employing the full-bridge inverter primary where zero voltage switching is implemented by short circuiting the primary during dead times in order to provide an efficient converter circuit.
Therefore, since providing efficient converter circuits to produce a nice regulated DC voltage is highly desirable, it would have been obvious to one having ordinary skill in the art at the time the invention was made given the circuit of Okamoto et al in combination with the teachings of Morris to provide an AC power source that includes dead time in order to provide an efficient soft switching circuit which would produce an efficient and well regulated DC voltage which is, after all, highly desired from the energy efficient demands of today's electronic circuits.

4. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al in combination with Morris in combination with Jacobs et al.

Okamoto et al in combination with Morris teach the claimed subject matter with regards to claim 1 except for replacing the diodes of the rectifier with synchronous rectifiers. It is all to well known in the art that especially with the increasing requirement in applications such as computers where there is demand for power supplies with even lower supply voltage, the conduction loss in the diode output rectifier becomes the biggest source of power loss in switching power supplies. Even the commonly used Schottky diodes have a relatively large voltage drop and, hence, a large power loss in such low-output-voltage applications. Consequently, low-voltage metal-oxide-semiconductor field-effect transistors which operates in the third quadrant, with a very low on-state resistance and fast switching speed can be used to replace the diodes in the output stage. The conduction loss can therefore be reduced to a very low value by paralleling more MOSFETs. The SR is also fast because it is a majority carrier device. Jacobs et al in Col.1 lines 20+ and Col. 9 lines 30+ teaches substituting diodes and synchronous rectifiers.
Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize synchronous rectifiers in place of the diodes in order to reduce conduction losses as is well known in the art that synchronous rectifiers provide.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al in combination with Morris further in combination with Trousdale and still further in combination with Schutten et al.

Okamoto et al in combination with Morris disclose the claimed invention as stated above in regards to claim 1 except for connecting a switch between the input terminals of the rectifier circuit and the switch being bi-directional.
Trousdale teaches that it is known in the art to connect a switch between the inputs of a rectifier circuit. However, the combination of Okamoto et al and Morris and further in combination with Trousdale do not teach the switch being bi-directional.
Schutten et al teaches that it is known in the art to connect a bi-directional switch between terminals of a rectifier circuit. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to connect a switch between the input terminals of a rectifier circuit to provide a new and improved electronic switch which may serve as a pulsing relay in applications where the controlled circuit may be of either polarity and where no direct current flow is permissible between the controlled circuit and the pulsing relay driving circuit as taught

by Trousdale and to further make the switch bi-directional as taught by Schutten et al for shaping voltage or current waveforms.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Mweene discloses a DC to DC converter which shorts the a portion of the primary winding of the transformer to stabilize the voltage level and reduce ringing.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L. Laxton whose telephone number is (703) 305-7039. The examiner can normally be reached on 5-4-9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on (703)308-1680. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

11/4/02

MICHAEL SHERRY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

GLL
November 4, 2002